

REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Consideration of reference “AO” in the Information Disclosure Statement filed on March 1, 2005 is respectfully requested.

Claim 8 has been allowed. Claim 2 has been cancelled and the subject matter thereof has been incorporated into Claim 1, which no longer recites “means plus function” limitations. Claims 4-6 have been indicated as being allowable and have been rewritten in independent form. The claims have been revised for clarity and responsive to the objection of paragraph 2 of the Office Action. It is noted that Claim 7 and allowable Claim 8 now recite “at least one sensor” rather than “sensors.” This is not believed to affect the patentability of these claims.

Applicants wish to thank Examiners Fristoe and Yu for the courtesy of an interview on August 17, 2005, at which time the rejection of Claims 1-3 and 7 and the claims were discussed. No agreement was reached at that time pending the Examiners’ further review of U.S. patent 4,605,085 (Honaga et al.). Claim 1 has been further revised as compared to that discussed during the interview.

The invention has been made in light of a problem present in a conventional power steering system having a fluid bypass whose flow is controlled by a spool positioned in dependence on the pressure drop across a variable throttle. That is, even if the opening degree of the variable throttle is maintained constant, the flow rate of fluid discharged to the hydraulic actuator is not constant but varies with the rotational speed of the pump, despite the functioning of the bypass spool, as illustrated by the dash lines in Fig. 4. This is because the flow velocity of the fluid being bypassed tends to close the bypass passage (page 2, lines 7-17).

Such a conventional power steering system includes Honaga et al. Honaga et al discloses a power steering mechanism in which pressure fluid from a supply passage 47 may be forwarded to a control valve 53 via an orifice 52, or bypassed to a bypass passage 48 via a control spool 45. A solenoid 64 is applied with a current commensurate with the vehicle speed to retract a rod 61 and thereby increase the opening of the throttle 52 (col. 3, lines 60-61). This results in a substantially constant pressure drop "A" across the throttle (Fig. 2) which, according to Honaga et al, provides a constant opening of the flow control spool 45 (col. 3, lines 62-64). However, the position of the flow control spool 45 will in fact tend to move to close the bypass due to the flow velocity of the fluid being bypassed, as discussed above.

According to a feature of the invention set forth in Claim 1, a flow controlling apparatus to control the flow rate of a working fluid discharged from a pump apparatus to a power steering apparatus includes an electric controller for controlling the solenoid mechanism to narrow down the opening degree of the electric variable throttle in accordance with the increase of the *rotating speed of the pump apparatus* when the rotating speed of the pump apparatus exceeds the predetermined value. This overcomes the tendency of the bypass flow rate to decrease in conventional flow control where the fluid flow rate increases while the opening of a variable throttle is maintained constant.

Claims 1-3 were rejected under 35 U.S.C. § 102 as being anticipated by Honaga et al. However this rejection is respectfully traversed. According to the Office Action, Honaga et al discloses means for increasing the flow rate of the by-pass flow to the by-pass passage when the rotating speed of the pump apparatus exceeds a predetermined value, in the form of the electric controller which controls the solenoid 42. However, as the Examiner has noted, the solenoid 42 of Honaga et al is actuated based on the vehicle speed, *and not the fluid pump speed* as is now explicitly recited in Claim 1. Thus the solenoid 42 maintains a constant

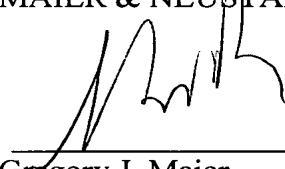
pressure drop "A" across the throttle 52 irrespective of the pump speed and does not narrow down the opening degree of the electric variable throttle in accordance with the increase of the rotating speed of the pump apparatus when the rotating speed of the pump apparatus exceeds the predetermined value. Since the fluid pump speed and the vehicle speed are different, Honaga et al does not anticipate Claims 1-3.

Claim 7 also recites that the electric controller controls the solenoid mechanism so as to narrow down the opening degree of the electric variable throttle in accordance with the increase of the rotating speed of the pump apparatus when the rotating speed of the pump apparatus exceeds a predetermined value. Claim 7 was rejected under 35 U.S.C. § 103 as being obvious over Honaga et al. However Claim 7 also defines over this reference since Honaga et al teaches that the flow control spool opens the bypass passage in accordance with the solenoid which is controlled according to the engine speed, and does not recognize the significance of using the fluid pump speed.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

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